



## USERS

- Barcelona City Council (Spain)
- Tallinn (Estonia)
- Edmonton (Canada)
- ICLEI European Secretariat, Freiburg (Germany)
- National Parks Board of Singapore (Singapore)
- European Environment Agency, Copenhagen (Denmark)
- Secretariat of the Convention on Biological Diversity (CBD), Montreal (Canada)
- ICLEI Cities Biodiversity Center, Cape Town (South Africa)
- and several more in the second phase of the project.

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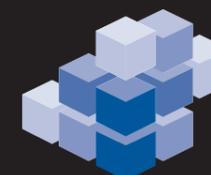


# EARTH OBSERVATION IN SUPPORT OF THE City Biodiversity Index

## E04CBI

A DUE INNOVATOR III ACTIVITY

2015 – 2017



**innovators**  
eoforcbi

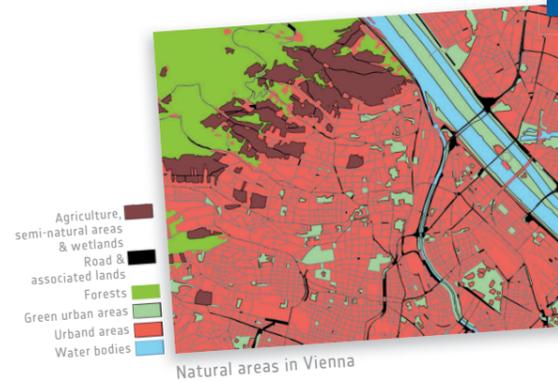


## PROJECT BACKGROUND

**Today, we are living in an urban world.** For the first time in history, there are now more people living in cities than in rural areas. In Europe their share has reached almost three quarters. Urban areas supposedly will absorb almost all the population growth expected over the next decades. This will pose a range of challenges for cities and their surroundings, not only on resource availability and the quality of urban environments, but also on biodiversity in cities.

**The World Summit on Sustainable Development** in 2002 assigned to the Convention on Biological Diversity (CBD) a target for 2010 in order to significantly reduce the rate of biodiversity loss. Since this target has been collectively missed, the new Aichi biodiversity targets aim to improve the status of biodiversity and to reduce the pressures on biodiversity by 2020.

**Capturing the status and trends** of biodiversity and ecosystem services in urban landscapes represents an important part of understanding whether a metropolitan area is developing along a sustainable trajectory or not.



## PROJECT OBJECTIVES

**The number of city authorities that use the CBI to monitor their biodiversity is still limited.** Many cities do not have the data, personnel and required GIS skills to assess some of the proposed CBI indicators. To help overcome this situation, the project provides support for several of the 23 indicators to potentially hundreds of cities, e.g.:

- **Indicator 1** "Proportion of natural areas in city"
- **Indicator 2** "Connectivity measures or ecological networks to counter fragmentation"
- **Indicator 11** "Regulation of quantity of water" and
- **Indicator 12** "Climate regulation: carbon storage and cooling effect of vegetation"

**The project partners** will use satellite-based data and combine them with appropriate in-situ and ancillary data to produce those indicators. They will be designed in a way to be directly usable by cities to assess their performance regarding the biodiversity targets.

**While the CBI indicators** are defined and described in the CBI User Manual, the methodology with which the indicators are produced are yet somewhat open. Therefore, we will develop and test methodologies for the before mentioned four of the indicators. The final aim of the project is to fill two of the major gaps of many cities, i.e. the lack of data and GIS skills.

## THE CITY BIODIVERSITY (OR SINGAPORE) INDEX

**Actions to conserve biodiversity** should start with stock-taking and identifying baselines, followed by regular monitoring of conservation initiatives. The City Biodiversity Index (CBI), also known as the Singapore Index on Cities' Biodiversity (or Singapore Index) because of Singapore's leadership in its development, has been adopted during COP-10 of the CBD in 2008. It is conceived as a self-assessment tool to evaluate the state of biodiversity in cities and to provide insights for improving conservation efforts. This includes an initial baseline measurement, the identification of policy priorities based on their measurements and then a monitoring at periodic intervals.

**Today, the CBI includes 23 indicators** from three categories such as the proportion of natural areas in the city or the budget allocated to conservation projects. The CBI is designed to be applied by many cities in the world to monitor their progress in conservation efforts and their success in halting the rate of biodiversity loss.

SINGAPORE INDEX ON CITIES' BIODIVERSITY		
Profile of the City	Indicators	Maximum Score
<b>Location</b> and size (geographical coordinates (latitudes and longitudes); climate (temperate or tropical); rainfall/precipitation (range and average); including maps or satellite images where city boundaries are clearly defined)		4 points
<b>Physical features of the city</b> (geography, altitude, area of impermeable surfaces, information on brownfield sites, etc.)		4 points
<b>Demographics</b> (including total population and population density; the population of the region could also be included if appropriate, and for the purpose of placing it in the regional context)		4 points
<b>Economic parameters</b> (Gross Domestic Product (GDP), Gross National Product (GNP), per capita income, key economic activities, drivers and pressures on biodiversity)		4 points
<b>Biodiversity features</b> (ecosystems within the city, species within the city, quantitative data on populations of key species of local importance, relevant qualitative biodiversity data)		4 points
<b>Administration of biodiversity</b> (relevant information includes agencies and departments responsible for biodiversity; how natural areas are protected through national parks, nature reserves, forest reserves, secured areas, parks, etc.)		4 points
<b>Links to relevant websites</b> including the city's website, environmental or biodiversity themed websites, websites of agencies responsible for managing biodiversity		4 points
<b>Core Components</b>		
<b>Native Biodiversity in the City</b>	1. Proportion of Natural Areas in the City	4 points
	2. Connectivity Measures	4 points
	3. Native Biodiversity in Built Up Areas (Bird Species)	4 points
	4. Change in Number of Vascular Plant Species	4 points
	5. Change in Number of Bird Species	4 points
	6. Change in Number of Butterfly Species	4 points
	7. Change in Number of Species (any other taxonomic group selected by the city)	4 points
	8. Change in Number of Species (any other taxonomic group selected by the city)	4 points
	9. Proportion of Protected Natural Areas	4 points
	10. Proportion of Invasive Alien Species	4 points
<b>Ecosystem Services provided by Biodiversity</b>	11. Regulation of Quantity of Water	4 points
	12. Climate Regulation: Carbon Storage and Cooling Effect of Vegetation	4 points
	13. Recreation and Education: Area of Parks with Natural Areas	4 points
	14. Recreation and Education: Number of Formal Education Visits per Child Below 16 Years to Parks with Natural Areas per Year	4 points
<b>Governance and Management of Biodiversity</b>	15. Budget Allocated to Biodiversity	4 points
	16. Number of Biodiversity Projects Implemented by the City Annually	4 points
	17. Existence of Local Biodiversity Strategy and Action Plan	4 points
	18. Institutional Capacity: Number of Biodiversity Related Functions	4 points
	19. Institutional Capacity: Number of City or Local Government Agencies Involved in Inter-agency Co-operation Pertaining to Biodiversity Matters	4 points
	20. Participation and Partnership: Existence of Formal or Informal Public Consultation Process	4 points
	21. Participation and Partnership: Number of Agencies/Private Companies/NGOs/Academic Institutions/International Organisations with which the City is Partnering in Biodiversity Activities, Projects and Programmes	4 points
	22. Education and Awareness: Is Biodiversity or Nature Awareness Included in the School Curriculum	4 point
	23. Education and Awareness: Number of Outreach or Public Awareness Events Held in the City per Year	4 point
	<b>Native Biodiversity in the City (Sub-total for indicators 1-10)</b>	<b>40 points</b>
	<b>Ecosystem Services provided by Biodiversity (Sub-total for indicators 11-14)</b>	<b>16 points</b>
	<b>Governance and Management of Biodiversity (Sub-total for indicators 15-23)</b>	<b>36 points</b>
	<b>Maximum Total:</b>	<b>92 points</b>

## RECIPIENTS OF THE SERVICE PRODUCTS

**The Singapore Index** serves as a self-assessment tool primarily for cities which are therefore the main recipients of the service. The project is implemented in two distinct phases. During phase 1 it is planned to involve three cities for testing the approach, while phase 2 will have a wider distribution to between six and ten cities. Pilot cities during phase 1 will be:

- **Barcelona (Spain)**
- **Tallinn (Estonia)**
- **Edmonton (Canada)**

**Next to the cities** as direct beneficiaries of the service, it is likewise paramount to involve international institutions and organisations that have a global reach and network. As representatives of this group, ICLEI (the world's largest city network), the Convention on Biological Diversity (CBD), The National Parks Board of Singapore (as lead organisation of the CBI development), and the European Environment Agency (EEA) are involved.